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Workshop *A study in resource-making: the finalization of food and agriculture*
The Hague – Institute of Social Studies, May 22 2015

Financing seeds for the future: dream or reality?

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Vice-President European Policy for Intellectual Policy (EPIP) Research Association

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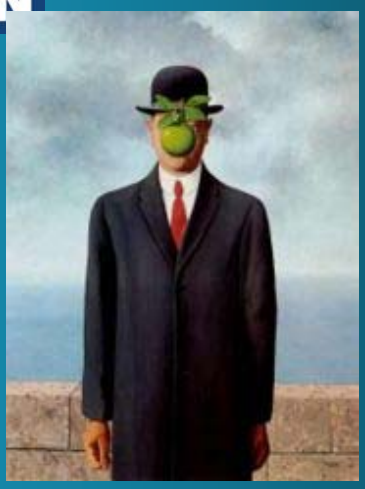

Focus (1)

(New) Food development	**Food production**
Traditionally bred plants/seeds	**Genetically engineered plants/seeds**

Focus (2): development genetically engineered plants/seeds

Commercially interesting plants (2nd world)	**Commercially non-interesting plants (3rd world)**
Development: NO big problem ample incentives/ample financing opportunities	**Development**: BIG problem hardly incentives/hardly financing opportunities
Access/Use: BIG problem restricted access? patent thickets?	**Access/Use**: NO problem no patent protection (ex. Burundi)

Outline

- Current legal patent framework for plants/seeds
- (Potential) Problems of plant/seed patents
- Possible solutions

Current patent framework for plants/seeds

Current EPO patent practice

- Plants *per se*
  - genetically modified plants (rDNAt)
    e.g. claims to the end product: modified plant cells, plants,seeds; intermediate products: vectors, plasmids, etc.
  - plants result of conventional plant breeding
- Plant traits
  e.g. claims to glyphosate resistance, increased anti-oxidant content
- Plant methods
  - transformation techniques (rDNAt)
    e.g. claims to *Agrobacterium* mediated gene transfer
  - (mix) conventional breeding (and molecular breeding) techniques; “marker assisted selection”
    e.g. broccoli patent, tomato patent

Potential problem

patentable subject matter, patentability requirements
– coming into **existence** of patent rights in biotechnology

RESTRICTED ACCESS

impact of patents
– exercise, **exploitation** of patent rights in biotechnology
[human genetics – plant breeding]

Potential problem

patentable subject matter, patentability requirements
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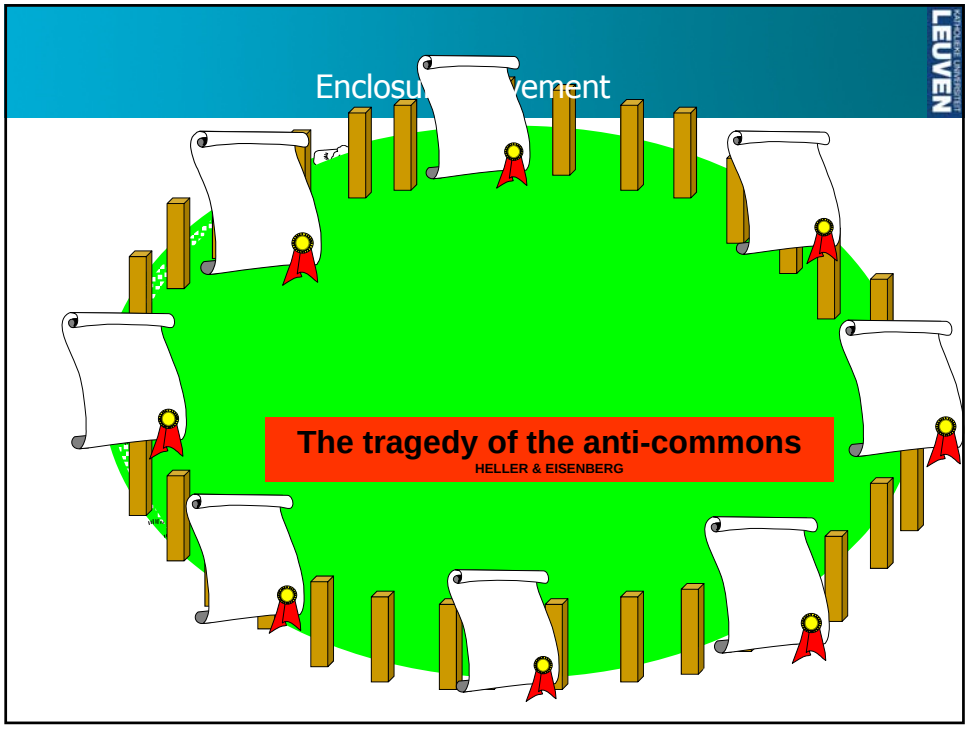
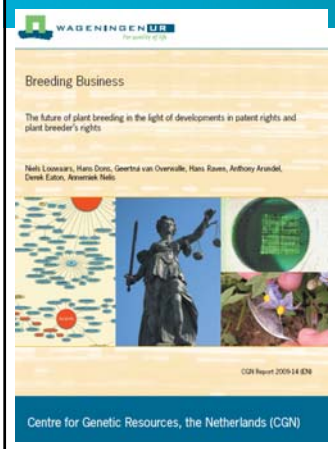
Relevance access to plant traits
= basis genetic variation
= most important source of innovation
= condition to safeguard food security/deal with consequences climate change

impact of patents
– exercise, **exploitation** of patent rights in biotechnology
[human genetics – plant breeding]



Restricted access – plant breeding?



Supported by *Position Papers*
ESA & ISF

Current IP regime leads to restricted access to genetic variation

- Patent thickets: high transaction costs resulting from many patents
- License structure: no/restrictive licensing at high cost

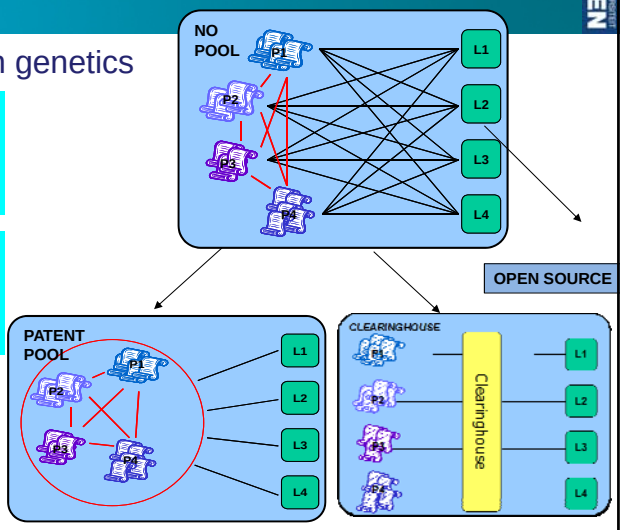
Huys, I., Berthels, N., Matthijs, G. and Van Overwalle, G. , 'Legal Uncertainty in the Area of Genetic Diagnostic Testing', 27, *Nature Biotechnology*, October 2009, 903-909

Legal toolbox facilitating access to patents

Our research – human genetics

Ban patents
Formal *legal* rules

Collaborative licensing models
Formal rules of *contract*



Van Overwalle G., *Gene Patents and Collaborative Licensing Models. About Patent Pools, Clearing Houses, Open Source Models and Liability Regimes in Human Genetics*, Cambridge, CUP, 2009

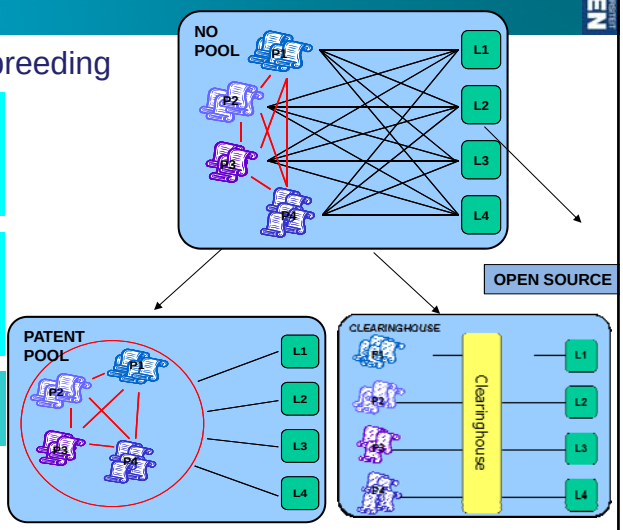
Van Overwalle, G., van Zimmeren, E., Verbeure B., Matthijs, G., 'Models for facilitating access to patents on genetic inventions', 7 *Nature Review Genetics,* February 2006, 143-148

Our research – plant breeding

Ban patents
Formal *legal* rules

Collaborative licensing models
Formal rules of *contract*

Gobal breeder's exemption in patent law



Best solution? Criteria

judge/legislator

Normative criteria

Internal criteria [embedded in the law]
e.g. fairness, equality, prevention distortion competition

External criteria [not directly embedded in law]
e.g. efficiency, cost reduction

Here

Internal *:*
- maintain current rationale of *patent* system to serve as a (positive) incentive for the production of plants
- *competition* law requirements

External:
- Access to genetic variation is essential for breeding crops in the future, and food security
- Feasibility

solution

Plant breeding

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Formal *legal* rules

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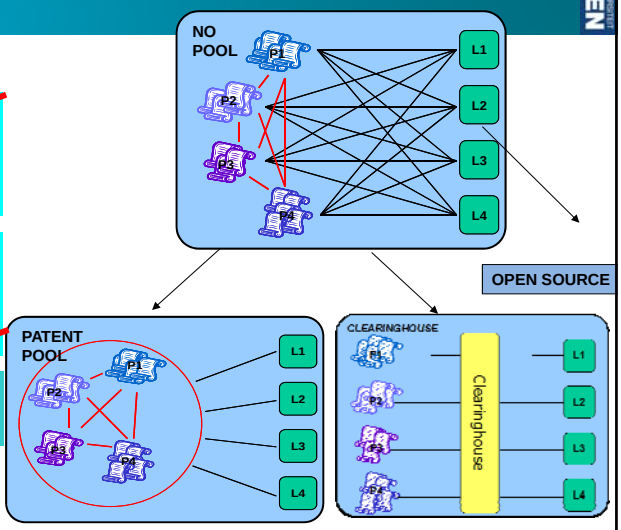
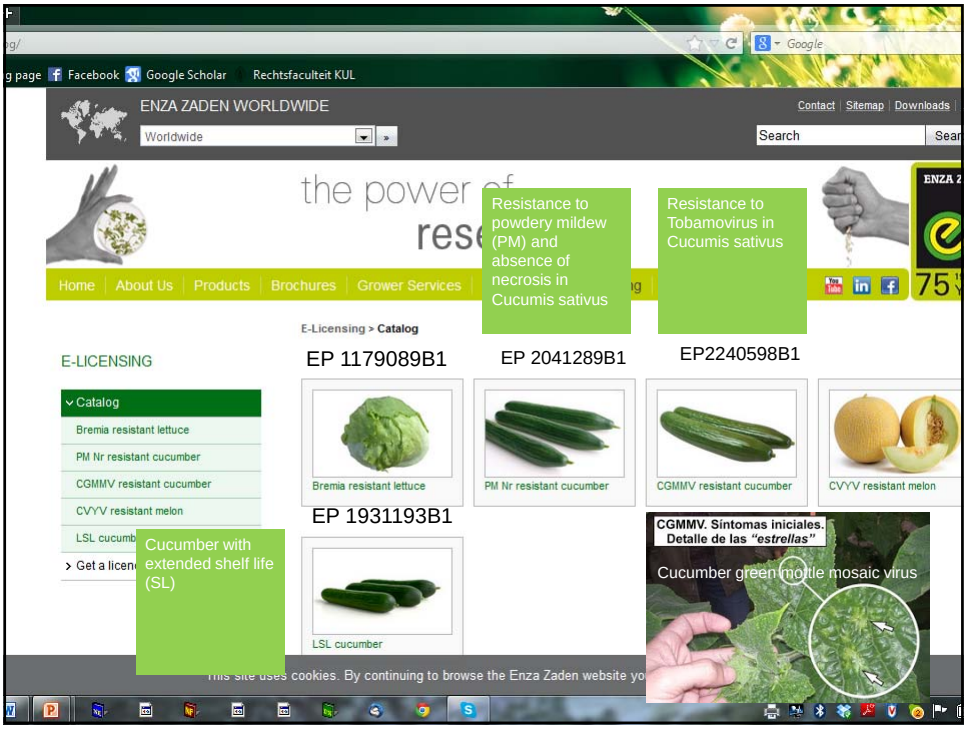


The more dominant the *legal* appropriation perspective becomes
The more room there should be for *extra-legal* sharing norms

Bilateral licenses, cross licenses, collaborative licenses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Catalog
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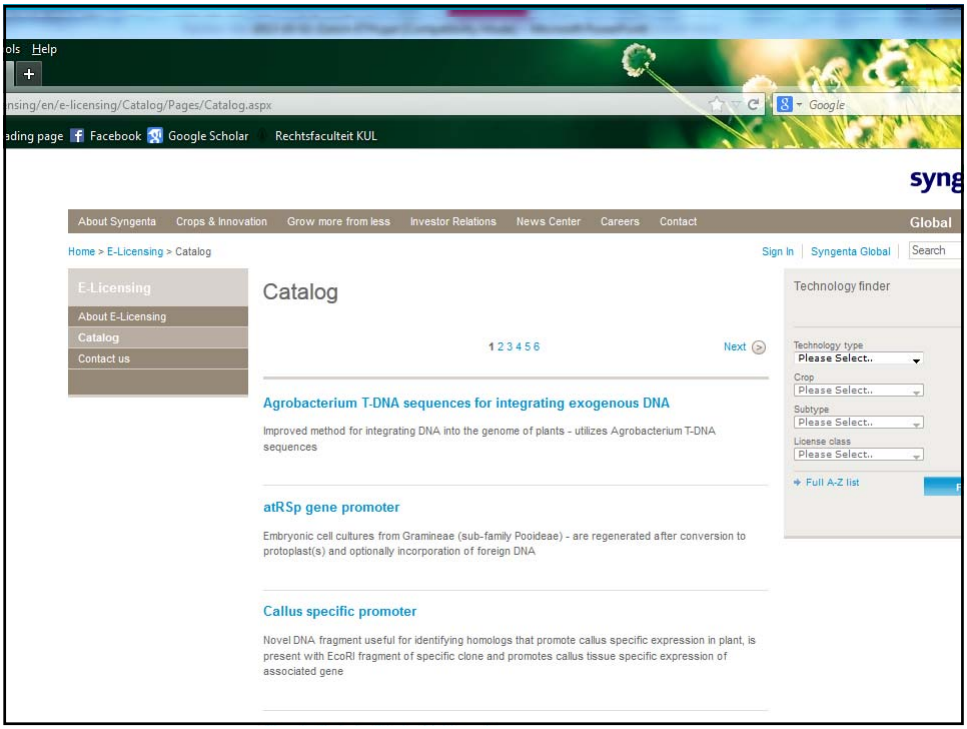
PM Nr resistant cucumber
CGMMV resistant cucumber
CVYV resistant melon
LSL cucumb
Get a licen
Resistance to powdery mildew (PM) and absence of necrosis in Cucumis sativus
Resistance to Tobamovirus in Cucumis sativus
EP 1179089B1
EP 2041289B1
EP2240598B1
Bremia resistant lettuce
PM Nr resistant cucumber
CGMMV resistant cucumber
CVYV resistant melon
EP 1931193B1
Cucumber with extended shelf life (SL)
LSL cucumber
CGMMV. Síntomas iniciales.
Detalle de las "estrellas"
Cucumber green mottle mosaic virus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Next
Agrobacterium T-DNA sequences for integrating exogenous DNA
Improved method for integrating DNA into the genome of plants - utilizes Agrobacterium T-DNA sequences
atRSp gene promoter
Embryonic cell cultures from Gramineae (sub-family Pooideae) - are regenerated after conversion to protoplast(s) and optionally incorporation of foreign DNA
Callus specific promoter
Novel DNA fragment useful for identifying homologs that promote callus specific expression in plant, is present with EcoRI fragment of specific clone and promotes callus tissue specific expression of associated gene
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WIPO | MAGAZINE

Adapting IP to an evolving agricultural innovation landscape

April 2013

By Dr. Michael A. Kock, Head of Intellectual Property, and Christine Gould, Global Public Policy Manager, Syngenta International AG

More than ever, innovation is needed to meet the challenges of a rapidly-growing world population which is poised to increase from 7 billion today to almost 9 billion by 2050. Higher calorie demand and an increased use of crops for biofuels will require agricultural production to increase by 70 percent by 2050 (OECD-FAO Agricultural Outlook 2010-2019). Climate change and decreasing availability of water and farmland will add further complexity to the situation. We need to meet this challenge by producing more with less - less land, and fewer inputs, including less fertilizer. This will only be possible if we maximize agricultural innovation in areas such as seeds, biotechnology, crop protection, resource-saving agricultural practices, storage and transportation. Similarly – and even more importantly given the complexity of this endeavor – we need to develop solutions that make it possible to integrate the variety of innovative elements

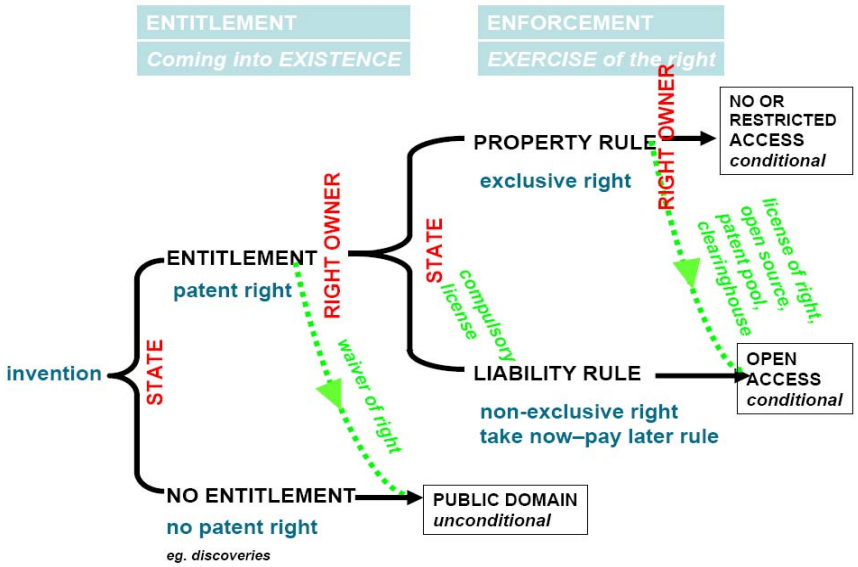
Developing an industry-wide licensing platform

Syngenta is also working with its partners, including small and medium-sized seed companies, to design an industry-wide licensing platform for vegetable traits. The aim again is to ensure easy access to these traits using transparent licensing conditions that carefully balance the interests of patent holders and licensees. This initiative enables the integration (stacking) of innovations from different parties and eliminates any risk that royalty payments may become a limitation to the development of an integrated solution.

"IP bashing" has become fashionable, but abandoning IP is a short-sighted and risky business."

To ensure it is widely adopted, the initiative includes a "pull-in" mechanism requiring licensees to make their own patents available to the platform. It operates on a "give-and-take" basis whereby each party that accesses a patented technology via the platform is required to provide access to their own patents under the terms of the platform. Everybody, irrespective of patent ownership, can participate in the platform. The initiative is not intended to replace bilateral licenses but rather to provide a safety net should bilateral negotiations fail. A concrete proposal detailing the industry licensing platform was submitted for review by the competent competition law authorities.

Conclusion so far



VAN OVERWALLE, G., 'Exclusive Property versus Open Commons. The Case of Gene Patents', *The WIPO Journal: Analysis and Debate of Intellectual Property Issues*, 4, 2013, 139-158

- Genes/plant traits and their informational content encompass large classes of resources, which benefit greatly from access *and* use to develop follow-on innovations
- The *ideal* type of management structure would be the 'totally open access' model for a fee/free

However

- The *Enza* and *Syngenta* e-licensing platforms = 'totally open access' regime: too restricted catalogue
- the "Industry Platform" = 'limited open access' model: restricted access and use (no access without consent); possible high/restrictive license terms

Utopia…

what can we see ? A new approach to open innovation

Universal and sustainable openness

Universal openness

- access and use for an unlimited amount of users [no one can be excluded]

Sustainable/perpetual openness

- unbroken chain of access and use

Strong normative ideal of sharing ethos

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Within the property paradigm

- Patents are central [control – not realisable via contracts alone – cf. open source software]
- Only right to include – not right to exclude

- Cheap [registration patent] – strong [high treshold]

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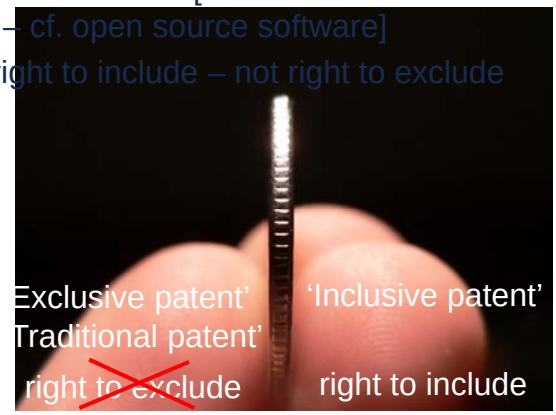

- Cheap [registration patent] – strong [high treshold]

‘Inclusive patent’

[legislator]

+

Open source *copyleft* type license

[user]

=

New appraoch to open innovation

[for a fee – not necessarily for free]

Ultimate objective…

Balance IP protection/access to safeguard food security

IP shall be open or IP shall not be